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DATE: January 17, 2000

BOX PATENT APPLICATION
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WASHINGTON, D.C. 20231

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01/17/00

DEAR SIR:

Transmitted herewith for filing is the patent application of:

INVENTOR(S): RANDY L. KNUST, ERIC SCHOPPE and RICHARD GARZA

FOR: AUTOMATED WAGERING RECOGNITION SYSTEM

Enclosed are: [X] Specification, Claims and Abstract
[X] Declaration and Power of Attorney
[X] Small Entity Status (Small Business Concern)
[X] Information Disclosure Statement
[X] Assignment
[X] 3 sheets of informal drawings

CLAIMS AS FILED

FOR:	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE \$345.00
TOTAL CLAIMS: INDEPENDENT CLAIMS:	16 - 20 3 - 3	= 0 = 0	x \$9.00 x \$39.00	= \$0 = \$0
TOTAL FEE				\$345.00

[X] The Commissioner is hereby authorized to charge any additional fees which may be required, to Deposit Account No. 07-2390. Please refund any overpayment.

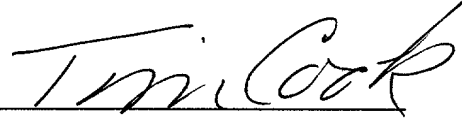
[X] A check in the amount of \$345.00 to cover the filing fee is enclosed.

Please date stamp and return the attached postcard to confirm receipt of this application.

CERTIFICATION UNDER 37 C.F.R. 1.10

I hereby certify that this New Application Transmittal and the documents referred to are enclosed therein and are being deposited with the United States Postal Service on January 17, 2000 in an envelope marked as "Express Mail Post Office to Addressee" Mailing Label Number EM278122245US, addressed to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Respectfully submitted,



Tim Cook

Attorney for Applicant

Registration No. 32,561

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	§	
Knust <i>et al.</i>	§	Examiner:
	§	
Serial No.: Unknown	§	Group Art Unit:
	§	
Filed: Herewith	§	Attorney Docket: GENE-13169
	§	
For: Automated Wagering	§	
Recognition System		

VERIFIED STATEMENT (DECLARATION)
CLAIMING SMALL ENTITY STATUS
(37 CFR §1.9(f) and §1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

- ☐ the owner of the small business concern identified below:
- ☒ an official of the small business concern empowered to act
on behalf of the concern identified below:

NAME OF CONCERN: Genesis Gaming Solutions, Inc.
ADDRESS OF CONCERN: 25211 Grogan's Mill Road
The Woodlands, Texas 77380

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR §121.12, and reproduced in 37 CFR §1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled Automated Wagering

Recognition System by Randy L. Knust, Eric Schoppe, and Richard Garza described in

☒ the specification filed herewith

☐ application serial no.: _____, filed _____

☐ patent no.: _____, issued _____

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR §1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR §1.9(d) or a nonprofit organization under 37 CFR §1.9(e).

FULL NAME:

ADDRESS:

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR §1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Randy L. Knust

TITLE OF PERSON OTHER THAN OWNER: President

ADDRESS OF PERSON SIGNING: 24950 Spring Ridge Dr. #215, Spring, Texas 77386

SIGNATURE: Randy L. Knust DATE: 1/14/00

APPLICATION FOR UNITED STATES LETTERS PATENT



FOR

AUTOMATED WAGERING RECOGNITION SYSTEM

BY

RANDY L. KNUST, ERIC SCHOPPE, AND RICHARD GARZA

0049384-014700

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Tim Cook	
Signature	
Date of Signature	17 Jan 2000

FIELD OF THE INVENTION

The present invention relates generally to the field of wagering systems and, more particularly, to a system and method for recognizing, recording, and tracking bets at a gaming table with the aid of a computer.

5

BACKGROUND OF THE INVENTION

10 The casino and gaming businesses provide special rewards for their valued customers to determine the level of complimentary benefits those customers should receive. Presently, this system is managed by a person such as a pit boss or other casino employee on the casino floor. Such a person keeps detailed notes about certain players and tries to determine the length of time a player gambles, the total amount of money bet in one sitting, the average amount wagered at each bet, and other information about these players. The casino may then determine which players
15 receive benefits such as lodging, meals, and other forms of special treatment.

20 The system just described depends almost entirely on the alertness and subjective analysis of the casino's floor observer or pit boss. Despite his best efforts, the pit boss can only observe a limited number of players at a time, and thus large casinos require quite a number of floor observers to cover the entire casino. Such a system is expensive, and by its very nature subject to mistakes in not gathering all of the available information to fully implement and exploit the system.

Fishbine *et al.*, in U.S. Patent No. 5,781,647 suggested a system that assists gambling operations at casinos in accurately tracking the gambling habits of its customers. The Fishbine *et al.* system tracked the length of the time a player played, amount of money he bet, and the average
5 amount he wagered at each bet in order to determine incentives and complimentary benefits (free meals, limo, room, *etc.*) which should be offered to the right players. Such a system was also used to determine a player's pre-established credit rating.

However, the Fishbine *et al.* system apparently used a dedicated
10 system for each player and was thus very expensive and inefficient for a large gambling operation. What is really needed is a system that can track the gambling of many players simultaneously in one system, and thereby perform the supervisory duties of one or more floor supervisors in a casino. Further, the Fishbine *et al.* system used an edge detection
15 algorithm to sense the edge of each chip in a stack of gambling chips to determine the amount of a bet and such an algorithm has proved prone to errors in making such a determination. The Fishbine *et al.* also made no allowance for the effective placement of video cameras in order to capture an accurate image of the gambling area. Thus, there is also a need for a
20 computer driven visual system for the gaming industry to more accurately determine the amount of a bet and to transmit information about a plurality of such bets to a central location for use and analysis.

SUMMARY OF THE INVENTION

The system of the present invention addresses these and other needs and drawbacks in the art to automatically track every bet made on a casino table game where the players gambling chips are placed in a predetermined area on the table surface for certain selected casino games. This allows the system to identify the player making the bet and assign the wager amount to his record.

The system includes a system of electronic computer hardware and software that can acquire a video (analog or digital) image of a stack of gambling chips placed in the betting area on the casino table. This is done by placing a color video camera or other video imager at the top level of a gaming table directly in front of each betting area and sending a video signal into an image grabber board located in a central computer unit. The position of the camera is critical for the analysis procedure.

The system and method of this invention can also quickly switch between individual players' bets at a specific table to acquire video signals between cameras on a table and from table to table. This feature is important for the acquisition and analysis of the gambling habits of a plurality of players. To accomplish this task, the system includes a video multiplexer having a plurality (such as, *e.g.*, eight) video inputs and one video display. These multiplexers may preferably be linked together to send a video signal from any camera in the pit to one central computer for image acquisition and analysis.

The system may also initiate the video read and capture from the active cameras on the casino table with a trigger device. This device can

be any kind of electronic button, foot pedal, mouse pad, *etc.*, controlled, for example, manually by a dealer.

Another feature of the present invention includes registering a client and designating his seat position at the table. This may be accomplished in
5 a variety of easily implemented ways, such as for example with a commercial magnetic card swipe reader with an attached keypad for data input.

The system can also send data from the trigger, magnetic card reader, and keypad into the central computer. This is carried out using a
10 computer serial board designed to accept data from the trigger, magnetic card reader, and keypad. These boards can be daisy-chained together and data can be sent through a serial cable from any table in the pit to one central computer for identification and processing.

In order to eliminate spurious signals, the system can also hide and
15 shelter the cameras on the table. The system includes a table platform to sit on top of the casino table, allowing the player to set his chips, drinks, and other items on top of the platform. The platform is lined with a light source (rope light, neon light, fluorescent light, or other light) to illuminate the chip stack with a consistent light. This feature prevents a shadow
20 effect on the bottom chips and also gives a more consistent color scheme or pattern for analysis.

Finally, the system can store data into a player tracking database program for viewing and analysis. This permits the casino to accurately track the playing of many players simultaneously in real time, and thus
25 eliminates the inaccuracies and subjective analysis of casino floor observers.

These and other features and objects of this invention will be apparent to those skilled in the art from a review of the following detailed description and the accompanying drawings.

5

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an overall schematic diagram of the gaming system of this invention.

Figure 2 is a perspective view of a gaming table including the cameras and lighting aspects of this invention.

10

Figure 3 is a plan view of the gaming table of Figure 2.

Figure 4 is an electrical schematic diagram illustrating the preferred arrangement for a plurality of video multiplexers arranged in tandem.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

15

Figure 1 depicts an overall system diagram of the computer assisted wagering recognition system of this invention, designated in Figure 1 by the numeral **10**. The system **10** includes a central computer **12** and accompanying monitor **14**. The system further includes a plurality of gaming tables **16**, of which eight are shown in Figure 1, although the system may include any number of such gaming tables. Further details of a gaming table **16** are shown below with regard to Figures 2 and 3.

20

In a preferred embodiment, the system **10** further includes a video multiplexer **18** at each table, or associated with each table, regardless of where the multiplexer **18** is physically located. The multiplexer **18**, which is described in greater detail below, receives inputs from a plurality of individual gaming sites, most clearly embodied in a video input from one

25

gaming seat, as shown in Figures 2 and 3. In a first alternative embodiment, the plurality of multiplexers 18 are joined together in series, or daisy-chained, so that data from a first table 20 is passed along to a second table 22, as so on until the data from all of the tables is passed
5 along to the central computer 12, such as for example into an RS-232 input of the computer. In a second alternative embodiment, the system 10 further includes a polling system 30, which signals each of the multiplexers 18 in turn, assembles a data packet of information including data from all of the tables 16, and forwards this data packet along to the
10 central computer 12.

Figures 2 and 3 show further details of a gaming table 16 in accordance with this invention. Figure 2 shows a perspective view, and Figure 3 shows a plan view of the table 16. The table 16 includes a platform 40 which is elevated slightly above a playing surface 42. The
15 platform is used by players to hold chips, drinks, and any other items they wish to place on it so that such items are out of the playing surface 42. Underneath the platform 40 are situated a plurality of cameras or video imagers 44, one camera or imager for each player, and, more specifically, one camera for each of plurality of wagering locations 46, on the surface
20 42. Each camera has a field of view 48 to view all of a wagering location 46 to which the camera is dedicated. Each camera 44 is preferably recessed under the platform 40 (Figure 3) to prevent extraneous visual images from being received by the camera. This is particularly true because an array of lights 50 is mounted on an inside wall 52 of the
25 platform 40 (Figure 2) or in a recess 51 beneath the platform (Figure 3) to illuminate the wagering locations 46 with a uniform and consistent light to minimize shadow effects associated with gambling chips. The lighting on the table also helps to maintain a consistent frequency spectrum of light

illuminating gambling chips, regardless of background lighting changes. The lights 50 preferably comprise fluorescent lights, but they may be incandescent or even flexible neon, infrared, and so on. The light from the lights 50 is projected outward onto the wagering locations 46, and away from the lenses of the cameras 44 to more tightly control the image received by the cameras 44 of the chips placed on the wagering locations 46. Further, the light spectrum of the lights 50 is especially selected to be unobtrusive to those sitting around the table, while maximizing the accuracy of the image captured by the cameras.

Note also that a rear edge 54 is preferably flush with the peripheral edge of the gaming table. The platform may be custom made to accommodate any desired gaming table dimension.

Pit Operation Procedure

In operation of this invention, a player sits at a casino table 16, and receives a designation, such as table 1, seat 1. He may hand the dealer his player's card, which preferably include a magnetic stripe which uniquely identifies the player, and provides access to biographical data regarding that player, including gambling history, and available line of credit, if any. The card is swiped into a magnetic card reader 60 and on a keypad 62 (Figure 1) the dealer indicates to the central computer 12 the seat number the player is sitting in. Although the card reader 60 and keypad 62 are only shown at one table in Figure 1, each table may have such equipment installed.

Swiping a particular card and keying in a specific seat designation sends a data signal (name and any other information on the card) to the

central computer 12 and clocks the player at table 1, seat 1, and the camera 44 in front of his betting circle is activated. If the player does not have a player's card, the dealer registers the player as a guest with the keypad and the above procedure is performed as previously described.

5 The dealer will also have the option to input the player's buy-in on the keypad 62. The keypad may also be used for a variety of other purposes by the dealer for communicating information to the central computer, such as for example certain codes which may be transmitted to a supervisor to relay information about customer, his bets, and other information.

10 Immediately prior to a deal, the dealer presses a trigger button 64 and a signal is sent into the central computer 12 telling the system to prepare to capture the video streams from the active cameras 44 on table 1. The central computer 12 sends a signal to the multiplexer 18 associated with table 1 and tells the multiplexer 18 to send the video
15 signal from table 1, seat 1 (and any other active seats at the table one by one as controlled by the multiplexer 18) into the computer's image grabber board for capture and analysis. This procedure takes only nanoseconds to complete.

After the image is captured, it is loaded into RAM within the central
20 computer 12 for analysis. The data from the image is then stored in a data base in the central computer 12 under the player's record. Now the data can be retrieved in player tracking software for viewing and analysis.

Operation of the Player Analysis Program

25 The method of the present invention begins with initializing the system. The central computer is programmed to carry out the method

without operator intervention, with certain interrupts entered as required, such as reading in player card data and designating table/seat values as valid when a player sits to play.

5 The program begins by reading all chip sample values from a central database, assigning visible characteristics to each denomination of chip. The system then reads operational variable values from a central database in the central computer 12 to fine tune the interpolation algorithm, skew analysis, chip sample height nominal values, maximum chips in stack to process, and chip matching method by seat, table, casino, 10 or any combination of these values.

Next, the system initializes all video multiplexer boards through the parallel port into the central computer. At this point, the system is now ready to begin tracking player activity and to receive inputs from the tables, such as trigger inputs from the dealers at the various tables and 15 video inputs from the cameras.

Once a dealer initiates a signal at his assigned table, preferably from the keypad 62, the system calls a process to read all active seats at the triggered table. The system then recursively calls the video multiplexer 18 for that table to cycle through all active seats at the table and store a 20 binary representation of each video picture in RAM at the central computer 12.

10. Based on the initialization sequence previously described, the system then finds a theoretical chip stack of n chips (where n is the predetermined maximum number of chips to read in a stack) from each stored video image 25 in RAM and selects a desired sample area based on the predetermined field of view 48. Fishbine *et al.*, U.S. Patent No. 5,781, 647, teaches an edge

detection scheme to determine the value of bets, but we have found this technique to be inadequately accurate for the purpose of gathering precise data regarding the amount of each bet from a plurality of wagering locations at a plurality of tables and in real time.

- 5a. Once the desired sample area has been determined, the system uses any appropriate interpolation algorithm to find the contact point or line between the bottom edge of the bottom chip in the stack based upon contrast, width, and steepness of the bottom chip against the table surface. The system calculates the inherent skew in the stack introduced by the camera location to allow for varying chip heights based upon each chip's theoretical placement in the stack. With the camera positioned a variable distance from the chip stack (but constant, known height above the surface 42), the stack's distance from the camera will determine the height of each theoretical chip in the stack. The vertical skew is estimated using a logarithmic curve calculation based on variables inherent with each seat including variable chip stack distances, chip height, and camera lens size. The formula to calculate the curve of vertical skew is:

$$(1) \quad y = (b * ((m1^{x1}) * (m2^{x2}) * (...)))$$

where:

20 b = constant of 1

m = chip height at x pixel location

x = pixel location of bottom chip table contact point

Y is solved as the width of the theoretical chip currently being processed by solving the formula:

25
$$y = b * (m^x)$$

where:

b = y intercept of the line

m = slope of the line

x = pixel location of bottom chip table contact point

5

Next, the system calculates each chip's height from the chip stack using the skew algorithm and selects a center sample height of $n * m$ pixels (where n is the sample height in pixels and m is the sample width in pixels). Then, it compares each theoretical sample chip area against the stored base samples to determine each chip's monetary value. In this step, the system performs a statistical analysis comparison of each sample area utilizing mean, median, standard deviation, average, minimum, and maximum values calculated from the multiple image component planes of the sample area of each chip. The planes may be Red, Green Blue (RGB) or Hue, Saturation, and Lightness (HSL) or any combination of these. Alternatively, the system may perform any appropriate particle analysis correlation algorithm to determine a unique pattern on each sample area correlated against a set of assigned patterns with associated monetary values. The system may also use a combination of these algorithms to determine chip stack value.

Next, using previously stored calibration data, the system finds the stored base sample that best matches the theoretical chip sample area within a predetermined tolerance factor to assign a monetary value to the bottom-most chip. If a base sample area does match and a monetary value is assigned, the process continues up to the next higher chip in the stack. If no base sample area matches the theoretical sample area within the

tolerance constraint, then the theoretical stack is assumed to have ended and no more theoretical chips are processed in the theoretical stack. In such a case, processing continues at the next active seat image.

Once the system has a match to the store data value, it stores the monetary value of the theoretical chip stack to the central database for the table/seat combination being analyzed.

Multiplexer Specifications

The video multiplexer (VM) **18** is a standard National Television Standards Committee (NTSC) (or any other appropriate format) video signal routing device with 8 inputs and 1 output. The VM may be used with 7 other VM's connected in series, as shown in Figure 1, or the VM's may be coupled in a star arrangement in the alternative embodiment of Figure 1.

Once all 8 VM's are connected to each other with control from a PC and video inputs from NTSC cameras, they are capable of choosing from any of 57 video signals. Typically, the seven cameras per board will be chosen before accessing cameras on a different board.

The VM's are designed to be daisy-chained together, as previously described. A first connection **70** couples the central computer **12** to a first VM **72**. The VM's address themselves dynamically so no special setup is needed to tell the first VM that it is the first VM. The one connected to the PC will always be the first with an address of 000_2 to 111_2 . Figure 4 depicts the preferred data communications arrangement for the multiplexers **18**.

The principles, preferred embodiment, and mode of operation of the present invention have been described in the foregoing specification. This invention is not to be construed as limited to the particular forms disclosed, since these are regarded as illustrative rather than restrictive.

- 5 Moreover, variations and changes may be made by those skilled in the art without departing from the spirit of the invention.

We claim:

1 1. A computer implemented gambling tracking system
2 comprising:

3 a. a central computer;

4 b. a video multiplexer coupled to the central computer;

5 c. a gaming table associated with the video multiplexer;

6 d. a plurality of video imagers on the gaming table, the
7 video imagers coupled to the video multiplexer, and each
8 of the plurality of video imagers directed to a
9 predetermined wagering location on the table; and

10 e. a chip recognition system in the central computer to
11 determine the value of the wagers in each of the
12 wagering locations.

1 2. The tracking system of claim 1, further comprising a platform
2 on the table above the predetermined wagering location wherein each of
3 the plurality of video imagers is located below the platform.

1 3. The tracking system of claim 2, further comprising a light
2 beneath the platform.

1 4. The tracking system of claim 3, wherein the light is positioned
2 within a recess beneath the platform.

1 5. The tracking system of claim 1, further comprising a trigger
2 coupled to the multiplexer to initiate operation of the system.

1 6. The tracking system of claim 1, further comprising a data input
2 means to uniquely identify a gambler to the tracking system.

1 7. The tracking system of claim 6, wherein the data input means
2 comprises a magnetic card stripe reader.

1 8. The tracking system of claim 1, further comprising data input
2 means for inputting alpha-numeric data manually into the central
3 computer.

1 9. The tracking system of claim 1, further comprising means for
2 determining which of the wagering locations is active.

1 10. A platform for placing on a gaming table, the platform
2 comprising:

3 a. a front vertical wall to face a gaming surface on the
4 gaming table;

5 b. a rear vertical wall behind the front vertical wall;

- 6 c. a horizontal surface supported on the front and rear
7 vertical walls; and
- 8 d. a light beneath the horizontal surface, whereby the
9 platform may be detached from the gaming table.

1 11. The platform of claim 10 wherein the rear vertical wall is
2 configured to conform to a peripheral edge of a gaming table.

1 12. The platform of claim 10, wherein the rear vertical wall is
2 curved.

1 13. The platform of claim 10, further comprising a video imager
2 beneath the horizontal surface.

1 14. The platform of claim 13, wherein the video imager is adapted
2 to provide a video signal to a central computer.

1 15. The platform of claim 10, wherein the front vertical wall is
2 curved.

1 16. A computer implemented gambling tracking system
2 comprising:

- 3 a. a central computer;
- 4 b. a plurality of gaming tables;

- 5 c. a plurality of video multiplexers, with one of the
- 6 plurality of multiplexers associated with each of the
- 7 gaming tables, the multiplexers coupled together in
- 8 series and coupled to the central computer;
- 9 d. a plurality of video imagers on each of the gaming
- 10 tables, the video imagers coupled to the video
- 11 multiplexer associated with its own gaming table,
- 12 and each of the plurality of video imagers directed
- 13 to a predetermined wagering location on the table;
- 14 and
- 15 e. a chip recognition system in the central computer to
- 16 determine the value of the wagers in each of the
- 17 wagering locations.

ABSTRACT OF THE DISCLOSURE

A system and method for acquiring and analyzing the bets at a plurality of locations at a plurality of tables is provided. The system includes a gaming table with a raised platform, underneath which is positioned a video camera for each of the wagering locations on the table. The video cameras on each table are coupled together into a multiplexer, and the multiplexers from the plurality of tables are coupled together and into a central computer. The system and method thus eliminate the labor intensive and often inaccurate technique of tracking the gambling habits of patrons at the gaming tables.

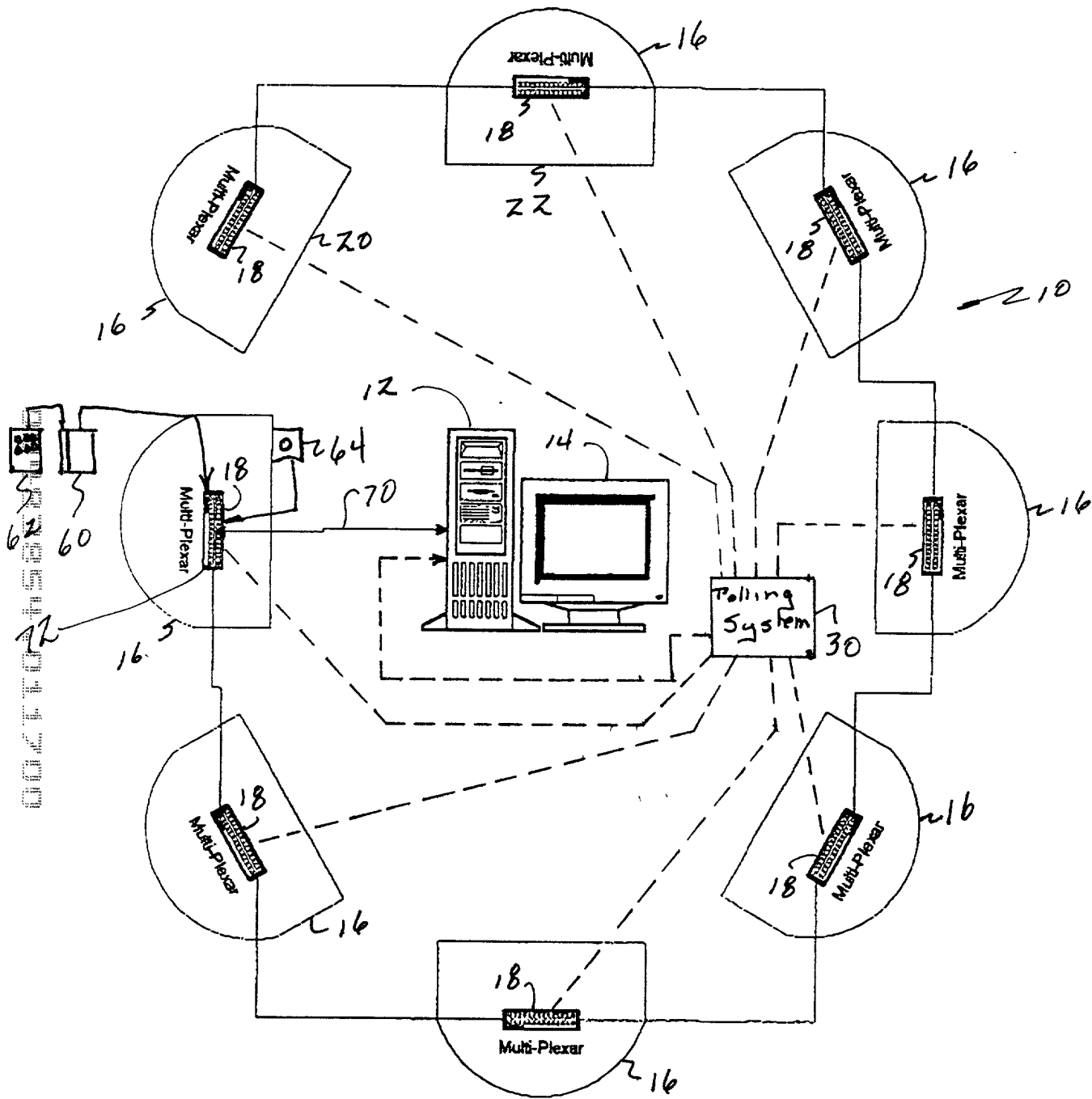


Figure 1

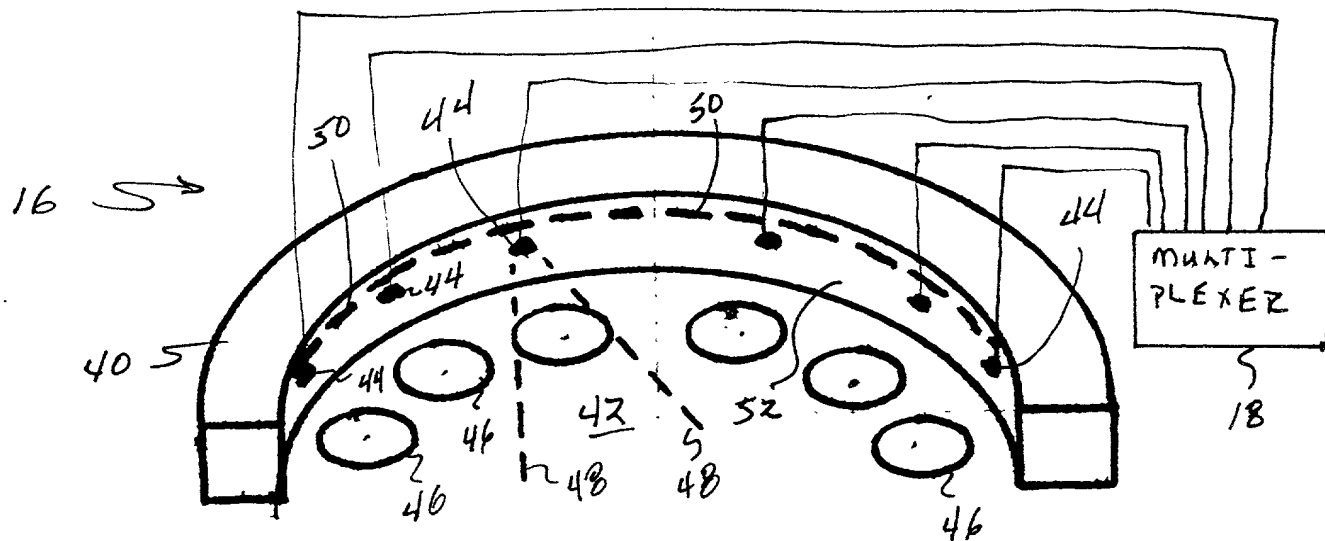


Figure 2

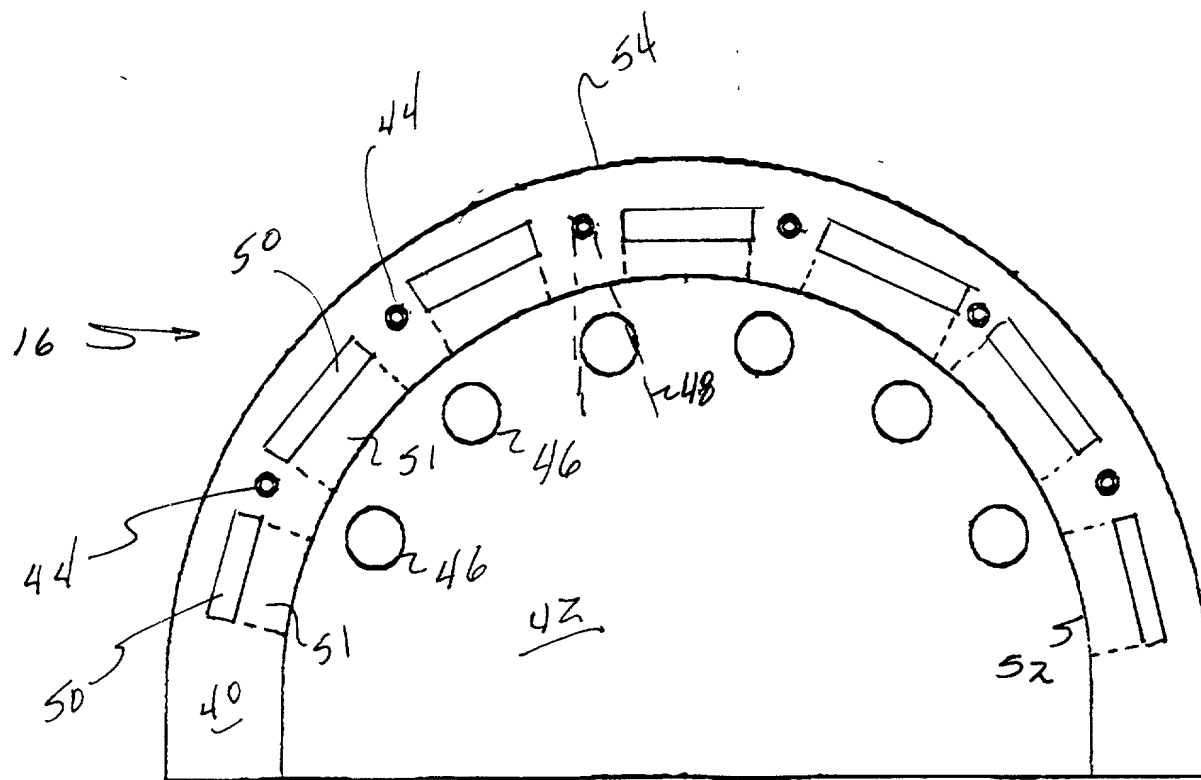


Figure 3

ATTORNEY DOCKET NO. 13169

DECLARATION

As the below named inventors, we hereby declare that:

Our residence, post office address and citizenship are as stated below next to our names.

We believe we are the original, first and sole inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled:

AUTOMATED WAGERING RECOGNITION SYSTEM

The specification of which:

☒ [X] is attached hereto.

☐ [] was filed on . as application Serial No.

We do not know and do not believe that such subject matter was ever known or used in the United States before our invention or discovery thereof, or patented or described in any printed publication in any country before our invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States more than one year prior to this application, or patented or made the subject of an inventor's certificate in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months prior to this application.

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations § 1.56(a).

We hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first

paragraph of Title 35, United States Code, 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial #

Filing Date

Status: patented, pending, or abandoned

We hereby appoint Tim Cook, Registration No. 32,561, of Gunn & Associates, P.C., Five Greenway Plaza, Suite 2900, Houston, Texas, 77046, as our attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

We hereby direct that all correspondence and telephone calls be addressed to Tim Cook, GUNN & ASSOCIATES, P.C., Five Greenway Plaza, Suite 2900, Houston, Texas 77046, (713) 850-9922.

We hereby declare that all statements made herein of our own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize that validity of the application or any patent issued thereon.

FULL NAME OF FIRST INVENTOR: **RANDY L. KNUST**


FIRST INVENTOR'S SIGNATURE: *Randy L. Knust*

DATE: **1/13/2000**

RESIDENCE: *23 WINDFELLOW PL THE WOODLANDS, TX 77381*

CITIZENSHIP: **US**

POST OFFICE ADDRESS: **Same as above.**

[illegible][illegible][illegible][illegible][illegible][illegible]

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